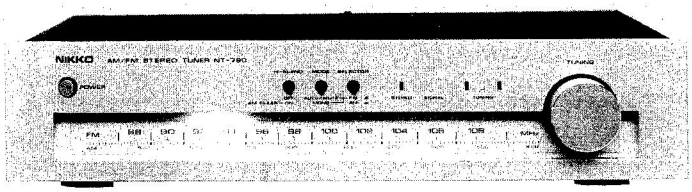
Nikko TUNER

NT-790

AM/FM STEREO TUNER



TYPE AND VOLTAGE

W-TYPE:	UL and CSA type	120V AC
E-TYPE:	NK-STD type	220/240V AC
N-TYPE:	DEMKO and SEMKO type	
D-TYPE:	DIN type	

SERVICE MANUAL

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SPECIFICATIONS

FM TUNER SECTION

〈W, E & N–TYPE〉

Usable Sensitivity: . . . . . better than 12 dBμ (4 μV)
50 dB Quieting Sensitivity:
. . . . . better than 16 dBμ (6.3 μV)
Signal to Noise Ratio: . . . . . better than 65 dB
T. H. Distortion (1 kHz)
Mono: . . . . . no more than 0.2 %
Stereo: . . . . . no more than 0.5 %
Alternate Channel Selectivity: . . . . . better than 35 dB
Sprious Response Rejection: . . . . . better than 65 dB
Image Frequency Rejection: . . . . . better than 45 dB
IF Rejection: . . . . . better than 65 dB
AM Rejection: . . . . . better than 40 dB

Capture Ratio: . . . . . better than 3 dB
Stereo Separation (100 Hz): . . . . . better than 30 dB
(1 kHz): . . . . . better than 40 dB
(10 kHz): . . . . . better than 30 dB
Subcarrier Suppression: . . . . . better than 38 dB
Muting Sensitivity: . . . . . 21 dBμ ±9 dB
Signal Ind. "ON" Sensitivity: . . . . . 30 dBμ ±10 dB
Stereo Ind. "ON" Sensitivity: . . . . . 21 dBμ ±9 dB
FM Frequency Range: . . . . . 87.9 ~ 108.5 MHz
Antenna Impedance:
. . . . . 300 ohms balanced & 75 ohms unbalanced
Output Level: . . . . . 700 mV ±2 dB

〈D–TYPE〉 They were measured according to DIN standard.

Usable Sensitivity: . . . . . better than 6 dBμ (2 μV)
50 dB Quieting Sensitivity:
. . . . . better than 20 dBμ (10 μV)
Signal to Noise Ratio: . . . . . better than 55 dB
T. H. Distortion (1 kHz)
Mono: . . . . . no more than 0.3 %
Stereo: . . . . . no more than 0.8 %
Alternate Channel Selectivity: . . . . . better than 65 dB
Sprious Response Rejection: . . . . . better than 50 dB
Image Frequency Rejection: . . . . . better than 50 dB
IF Rejection: . . . . . better than 65 dB
AM Rejection: . . . . . better than 40 dB

Capture Ratio: . . . . . better than 3 dB
Stereo Separation (100 Hz): . . . . . better than 30 dB
(1 kHz): . . . . . better than 40 dB
(10 kHz): . . . . . better than 30 dB
Subcarrier Suppression: . . . . . better than 35 dB
Muting Sensitivity: . . . . . 10 dBμ ±6 dB
Signal Ind. "ON" Sensitivity: . . . . . 30 dBμ ±10 dB
Stereo Ind. "ON" Sensitivity: . . . . . 10 dBμ ±6 dB
FM Frequency Range: . . . . . 87.5 ~ 108.5 MHz
Antenna Impedance:
. . . . . 300 ohms balanced & 75 ohms unbalanced
Output Level: . . . . . 340 mV ±2 dB

AM TUNER SECTION

Usable Sensitivity:
. . . . . better than 42 dBμ (125.9 μV)
Signal to Noise Ratio: . . . . . better than 40 dB
Image Frequency Rejection
(1000 kHz): . . . . . better than 25 dB
IF Rejection: . . . . . better than 30 dB

Selectivity (±10 kHz): . . . . . better than 15 dB
T. H. Distortion: . . . . . no more than 3 %
Signal Ind. "ON" Sensitivity: . . . . . 40 dBμ ±15 dB
AM CLEAR switch (400 Hz): . . . . . –5 dB ±3 dB
AM Frequency Range: . . . . . 530 kHz ~ 1630 kHz
Output Level: . . . . . 130 mV ±2 dB

GENERAL

Power Requirement
W–TYPE: . . . . . AC120V 60 Hz
E, N & D–TYPE: . . . . . AC220V 50 Hz
Power Consumption: . . . . . 8 Watts

Dimensions (Width): . . . . . 420 mm (16 1/2 inches)
(Height): . . . . . 96 mm (3 5/8 inches)
(Depth): . . . . . 325 mm (12 3/4 inches)
Weight: . . . . . 4.5 Kg (9.9 lbs)

Specifications subject to change without notice.

BLOCK DIAGRAM

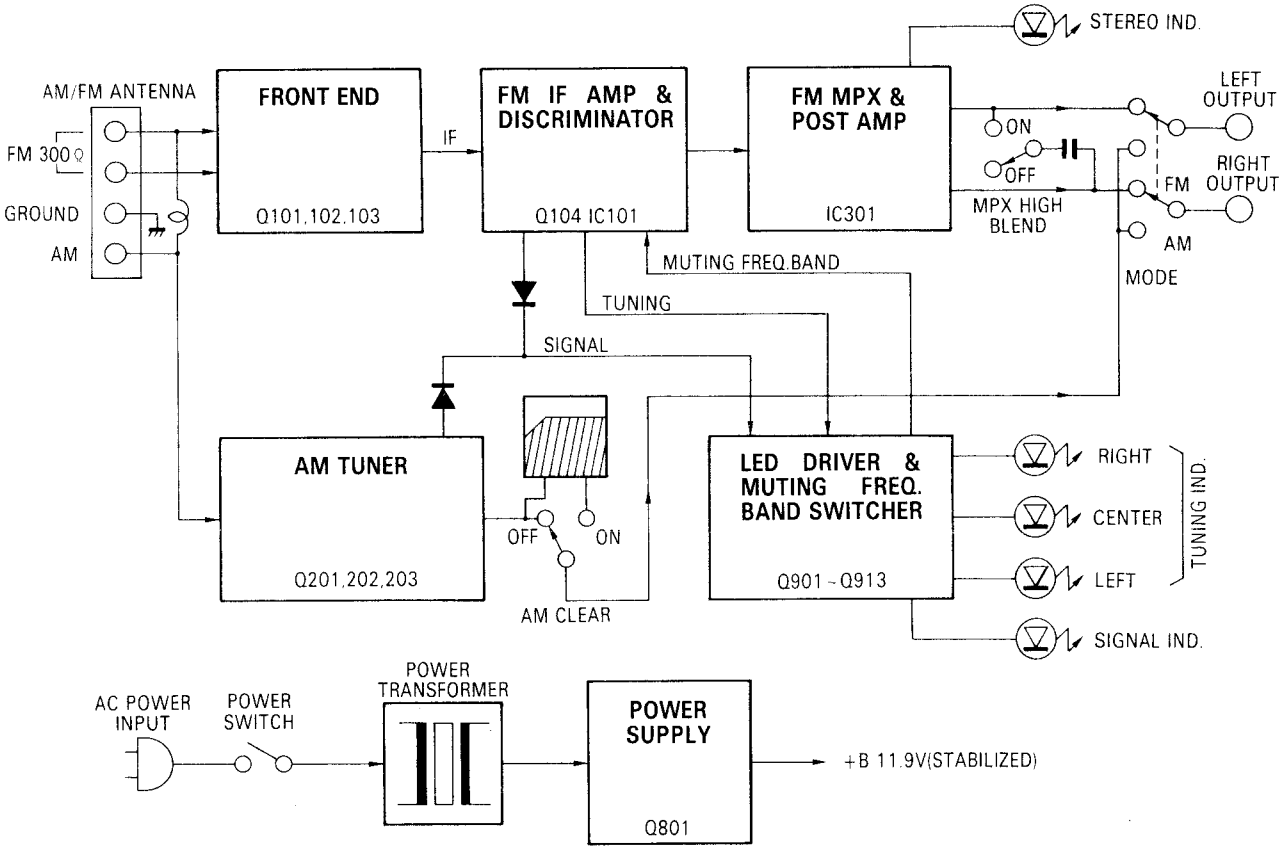


Figure 1

CIRCUIT DESCRIPTION

LED Display Circuit

In place of conventional needle indicators (usually used in analog meters), four LED's are employed in NT-790 indicate input signal and tuning.

The circuit that drives the LED's is unique and has not been used previously in any device.

The followng describes the implementation, maintenance, and the operation of NT-790.

Please refer to Block Diagram on page 2 and Schematic Diagram on page 12.

It contains 13 transistors and four LED's in addition to a numbers of RC elements. Two out of 13 transistors, Q908 and Q909 drive the Signal Indicators in AM and FM modes. The remaining transistors besides driving the Tuning Indicator in FM mode, perform some important functions described below. One of the LED's serves as the Signal Indicator and the remaining three are used for Tuning Indication.

1. AM Mode

AM signals are received and processed by the AM tuner to yield AM IF signals. Part of the AM IF signal pass through C210 and rectified by D202, D204. When the DC voltage reaches about 0.6V, Q908 is turned on and then Q909 is turned on. As a result of this, current flows through R910, LED903, the emitter and the collector of Q909. Then LED903 is fired which indicates that the signal is being received. When out of tune or weaker signal is present, Q908 will remain off, and as a consequence, LED will not be fired.
However, the ability to receive the signal exists.

2. FM Mode

(a) Characteristics of IC (LA 1231)

In order to understand the operation of this circuit that receives the FM signal, the characteristics of the IC101 (LA1231) has to be known. Part of this characteristics is shown in Fig. 2 ~ 4. This characteristics describe the voltage of the circuit shown in Fig. 5.

The terminal voltage of the IC changes in a wide range according to level of IF signal applied to IC, as shown in Fig. 2. V13 fluctuates proportionately to the input level. It generally drives the signal meter. V12 is the muting signal. It is changed by the DC voltage applied to pin 16, if the input level keeps a constant level. Pin 16 of the IC is connected to pin 13 through R136, output voltage characteristics of pin 12 is resulted in the dotted line of Fig. 2.

Fig. 3 shows the output voltage of pin 12 when input level is constant and input frequency deviates from target-frequency.

Note that the frequency range in which V12 goes to zero according to values of resistor connected between pin 7 and 10 in the figure. That is when the value of resistor becomes larger, the range narrows. When the value drops, the range widens. We call the frequency range "Muting frequency bandwidth".

Similarly, Fig. 4 shows voltage difference between pin 7 and 10 when input voltage remains constant and input frequency deviates from target-frequency. Usually this voltage drives tuning meter, but in NT-790 it is used as a signal that the tuning indicator has been fired.

(b) General operation of the circuit

Consider turning the frequency knob from a lower (or higher) value to the desired value.

1) Initially, due to being away from the target-frequency, the pin 13 of IC101 will be at zero volt, hence Q908 which connected to IC101, is cut off. As a result of this Q909 is cut off, and hence LED903 is off. Also, pin 12 will be at about 4.5V, which turns on Q906 and Q910 because Q906 is connected to pin 12 through R135 and R902, Q910 is connected to pin 12 through R135 and R913. First, consider the operation of Q906. If Q906 is turned on, Q909 which is connected to its emitter, will be cut off.
Consequently, Q902 and Q903 connected to the collector of Q906, are off. Therefore, Q904 and Q905 connected to the collector of Q902 and Q903 will not conduct, LED901 and LED902 which are connected to the collector of the transistor will not fire. Notice, circuit of Q902 ~ Q905 conduct only when the logical-AND circuit served by Q906 and Q908, is satisfied. Next, Q911 goes off because Q910 goes on, and LED904 is off. When Q912 is on the collector voltage is at zero. Q912 is connected with the gate of Q901 through R901. Due to low voltage, Q901 is cut off. Pin 7 and pin 10 of IC101 are connected to R138 and R139. See Fig. 3 "Muting frequency band".

2) When in-tune, the voltage at pin 13 of IC101 increase up to approximately 0.6V at which time Q908 goes on, hence Q909 goes on too. At this time LED903 begins to fire. AND circuit composed of Q906 and Q909 goes to logical-tune and Q902 through Q905 begin to function. Q902 and Q903 are differential amplifiers which amplify the voltage shown in Fig. 4. When the target-frequency is approached from a lower frequency, voltage at pin 7 of IC101 will be higher than that at pin 10. Q902 accepts larger bias than Q903 hence the collector voltage of Q902 drops. Therefore Q904 which is connected to the collector of Q902, goes on. LED901, fires and indicating that the frequency is lower than the target-frequency, when target-frequency is approached from a higher frequency, the reverse of the events take place: Q903, Q905 LED902 fired.

3) At the target-freuqency, voltage at pin 12 of IC101 goes to zero as shown in Fig. 3. Q906 is cut-off, hence AND circuit goes to logical false. Q902 through Q905 do not function. LED901 (LED902) stops firing. Q910 is cut-off and Q911 goes on at the same time. Now, LED904 fires indicating the target-frequency has been reached. Q912 goes off and its collector voltage will go high after 3 ~ 5 seconds depending on the time constant of R918, and C903.
As this voltage turns on Q901 through R901, R138 is shorted by Q901, therefore the resistance between pin 7 and pin 10 of IC101 is caused by R139. "Muting frequency bandwidth" as shown in Fig. 3 sweeps a wide band. The voltage at pin 12 of IC101 is stable at 0 volt even if a local oscillation fluctuates in its frequency. If "Muting frequency bandwidth" is confined in a narrow band, this voltage will not always be stable at 0 volt, due to fluctuations. LED901 (or LED902) and LED904 will fire in random, an undesirable event.

(c) Operation when the power is turned on

Q907 and Q913 whose function has not been explained, function as soon as the power is turned on. Consider the case that the device is tuned-in which the power source is off. (When the power is turned off in a stereo equipment with tuner, the tuner-knob is used to tune the stereo system's tuner. Now when the power is turned on, the tuner will be tuned-in the frequency previously set) when power is turned on, output voltages of pins stabilize within 1 — 2 seconds enabling correct operation of IC101. During this short time, unstabilized voltages cause LED901, LED904 to fire randomly, an undesirable feature. In equipments where a tuning needle is used, there fluctuating pin voltages cause the needle to swing right and left before stabilizing at the center.

However, due to needle inertia, this action is not very noticeable. In contrast, NT-790 LED's react instantaneously resulting sporadic flashes which are surely very noticesable. Q907 and Q917 are used to rectify the sporadic flashes in NT-790's, as described below.

When the power is turned on, C901 is charged to its full capacity at which time the Q907's base, connected to C901, is energized which results in Q907 to be on and Q906's base to be at ground potential. Therefore the voltage at pin 12 of IC101 will not change Q906's state of cut off.

Since Q902 through Q905 are cut off, LED901 and LED902 will not fire, when Q907 is cut off the zero voltage at pin 12 of IC101 remains so. As long as Q906 remains cut off LED901 and LED902 will not fire.

Q913 remains cut off (for 3 ~ 5 seconds depending, upon R922, R923, and C904 connected to Q913's base) and Q913's collector is at about 12V, the source voltage. This voltage applied to Q901's gate through R925 turns on Q901. Hence R138 is short circuited causing "Muting frequency bandwidth" to widen. The frequency drift at the time the power turned on is included in the "Muting frequency bandwidth" and for reasons mentioned above in reference to Q907, LED904 fires indicating tuned-in frequency. After some time Q913 is turned on and its collector voltage drops, at this time a voltage appears at Q912's collector through R901. IC101 keeps a wide "Muting frequency bandwidth". Operation of Q907 and Q913 eliminates undesirable random flashes of the three LED's.

IF INPUT LEVEL VS. PIN VOLTAGE

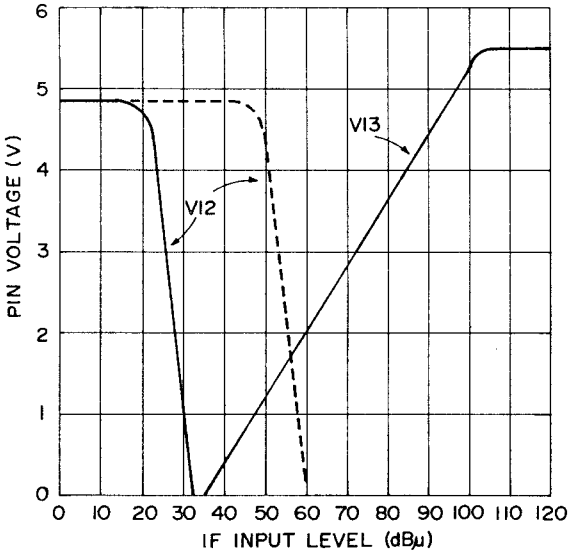


Figure 2

DETUNING FREQUENCY VS. PIN VOLTAGE

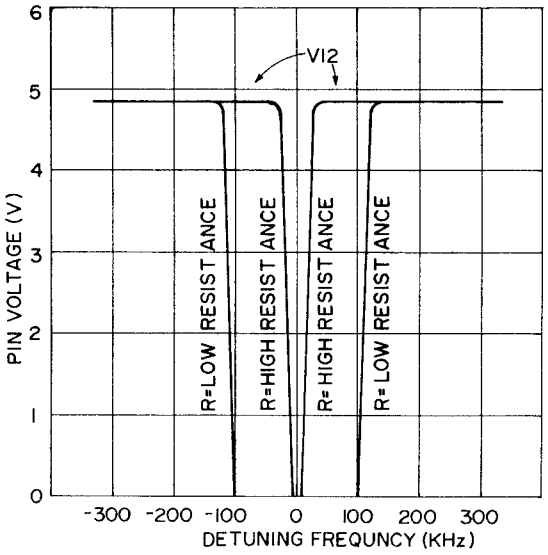


Figure 3

DETUNING FREQUENCY VS. VOLTAGE

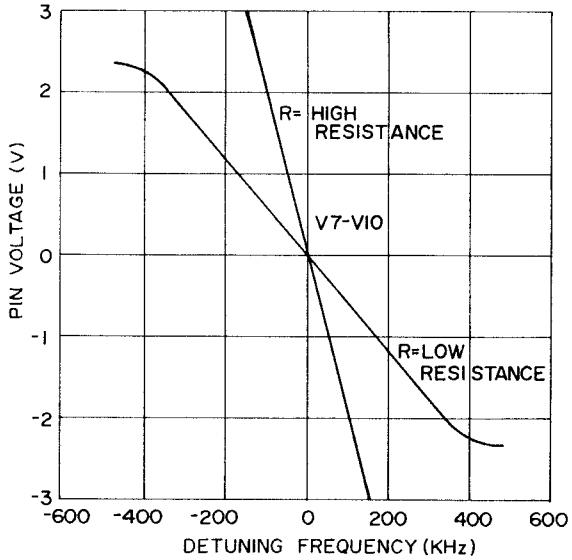


Figure 4

PIN VOLTAGE MEASUREMENT

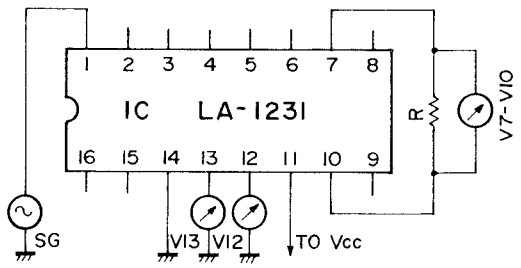


Figure 5

DISASSEMBLY

CABINET COVER REMOVAL

a. Remove three tapping screws from the top of the metal cover.
b. Remove six screws from both sides of the metal cover.

BOTTOM PLATE REMOVAL

a. Remove four tapping screws (#1 ~ #4) shown in Photo 1.
b. Remove two tapping screws (#5, 6) (Photo 1).
c. Remove two tapping screws (#1, 2) shown in Photo 2.
d. Lift the front panel away from the unit.

TUNER PC BOARD REMOVAL

a. Disconnect cables from the circuit board.
b. Remove ten tapping screws (#3 ~ #12) shown in Photo 2.

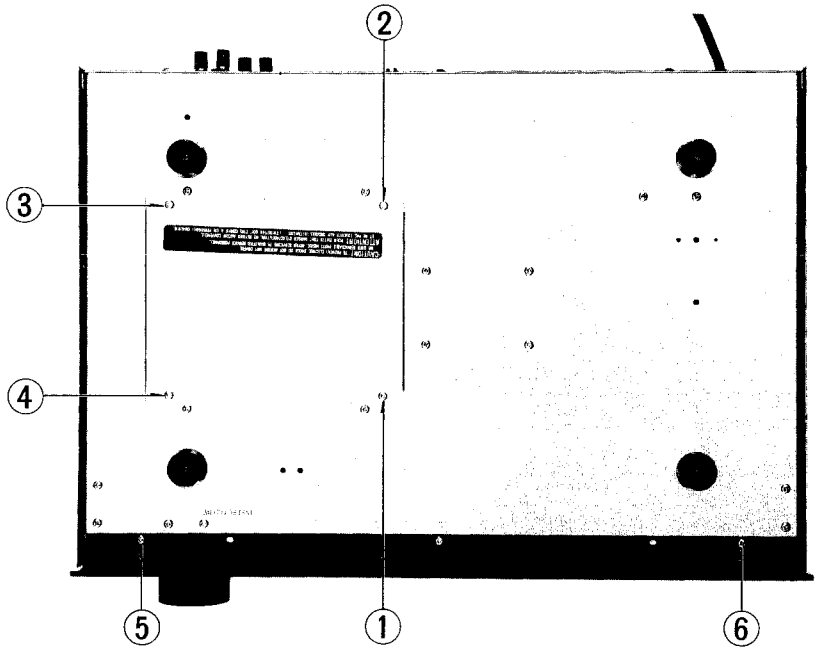


Photo 1

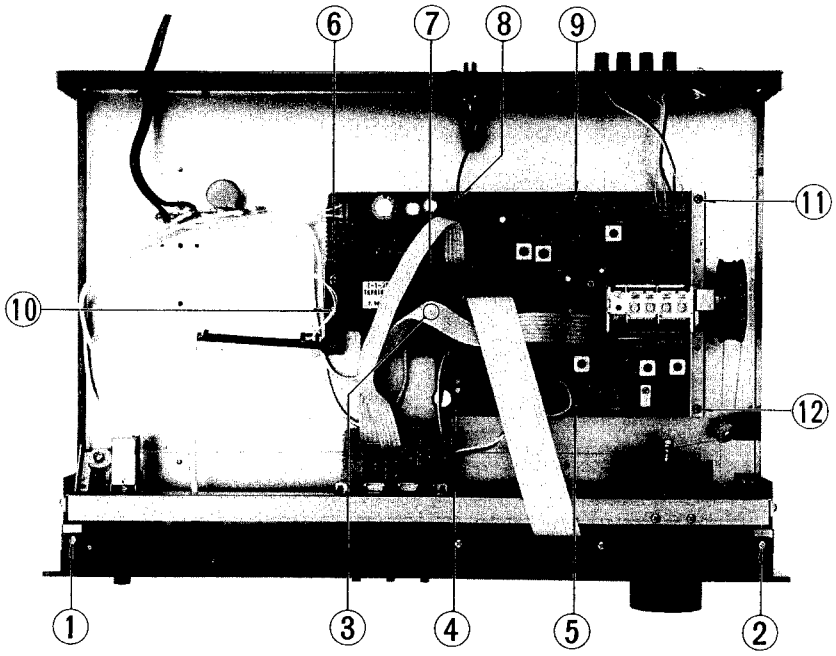


Photo 2

ALIGNMENT

TEST EQUIPMENT

Allow a minimum of 10 minutes warm-up for test equipment and the tuner to be tested.
Maintain rated line voltage.

FM Signal Generator (FM SG)
Oscilloscope
AC Voltmeter
Distortion Meter
MPX Signal Generator (MPX SG)
Frequency Counter
AM Sweep Generator (AM SG)
DC Voltmeter

GENERAL ALIGNMENT INSTRUCTION

Always observe response curve on oscilloscope during alignment procedure:

1. Do not apply signal from FM or AM stations. Apply signals only.
2. Use of excessive signal from FM SG or AM SG can cause overloading of the tuner circuits. To properly align the tuner, adjust FM SG or AM SG output level control so that response curve on oscilloscope is not distorted.

FM SECTION

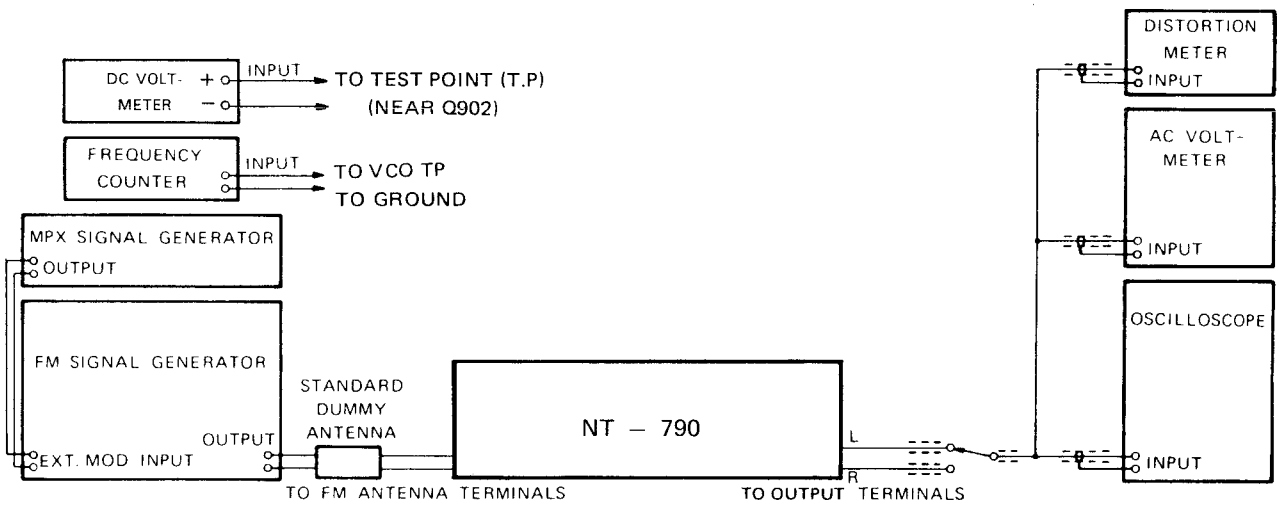


Figure 6. Test Equipment Hook-up

There is no "Tuning Meter" in NT-790. In order to tune fast and accurately, a DC voltmeter is used in place of a "tuning meter". DC voltmeter may have a scale up to 2.5 – 5V, but its accuracy is not important. DC voltmeter is connected to the test point "Tuner Reg PCB" (Test point near Q902).

Output voltage characteristics of IC101 is shown in Fig. 4 on page 4. According to this characteristics, voltmeter's needle may swing backward when adjusting. In this case, simply reverse the voltmeter connections. Voltmeter's zero reading corresponds to tuning meter's mid-scale reading.

FM IF Alignment

STEP	FM SG FREQUENCY/ CALIBLATION	MODULATING FREQUENCY/ DEVIATION	SWITCHES OF THE TUNER	DIAL POINTER POSITION	ADJUST-MENT POINT	PROCEDURE	REMARKS
1			A. POWER to "ON". B. SELECTOR to "FM". C. MODE to "MONO".	Where no signal is tuned.	T102 (Figure 7)	Adjust until DC voltmeter indicates zero volt.	Repeat steps 1 and 2 until distortion can no longer be minimized.
2	98 MHz/60 dBμ	400 Hz/mono [±75 kHz]		98 MHz	T101 T103 (Figure 7)	Adjust for minimum distor-tion.	

Table 1 – 1

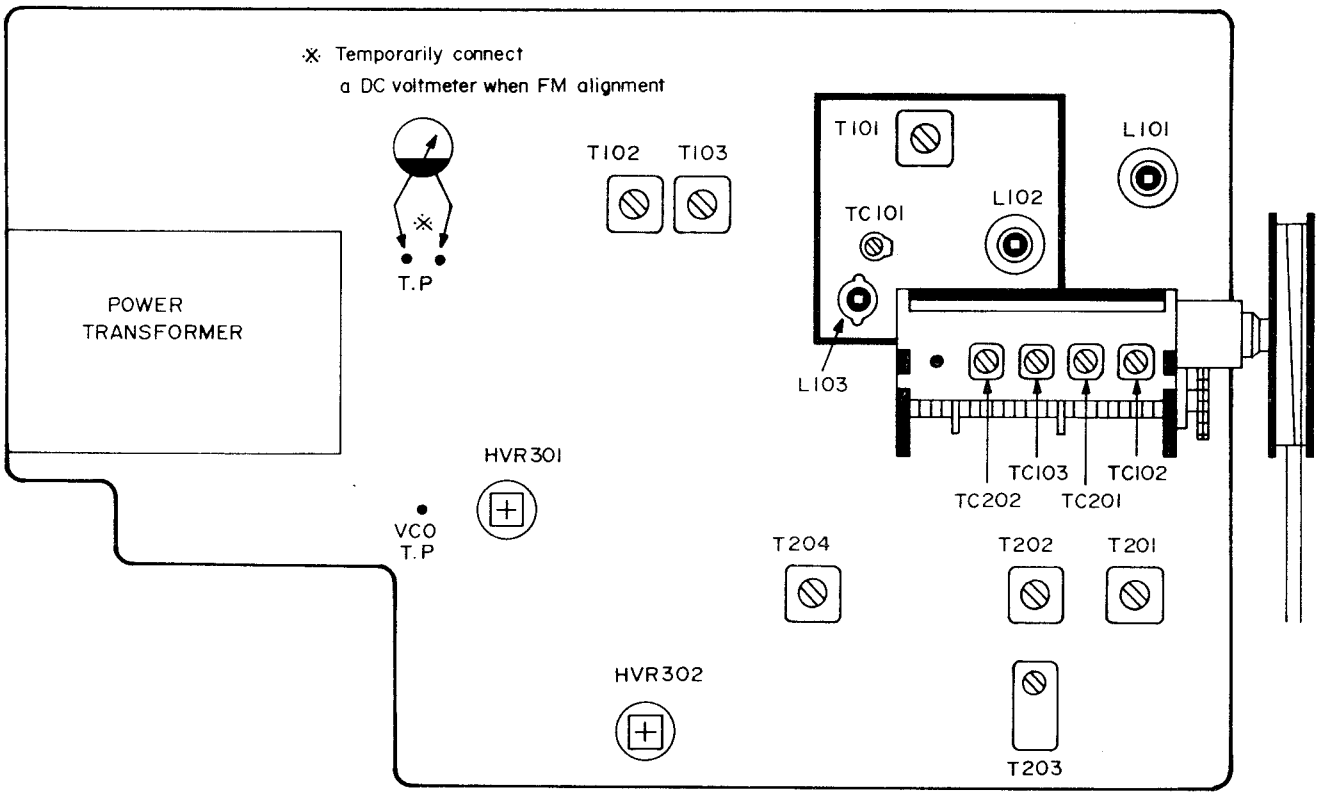


Figure 7. Adjustment Point

FM Frequency Coverage and FM Tracking Alignments

These adjustments are factory preset and normally need no further adjustment.
However, if necessary proceed as follows:

STEP	FM SG FREQUENCY/ CALIBLATION	MODULATING FREQUENCY/ DEVIATION	SWITCHES OF THE TUNER	DIAL POINTER POSITION	ADJUST-MENT POINT	PROCEDURE	REMARKS
1	88 MHz/10 dBμ	1000 Hz/mono [±75 kHz]	A. POWER to "ON". B. SELECTOR to "FM". C. MODE to "MONO".	88 MHz	L103 (Figure 7)	Adjust for maxi-mum AC Voltmeter deflection and for zero volt DC volt-meter indication.	Repeat steps 1 and 2 several times.
2	108 MHz/10 dBμ			108 MHz	TC101 (Figure 7)		
3	88 MHz/ Attenuate for response with 3% distortion.			88 MHz	L101 L102 (Figure 7)	Adjust for maxi-mum output.	Both the outputs should be equal. Repeat steps 3 and 4 once or twice.
4	108 MHz/ Attenuate for response with 3% distortion.			108 MHz	TC102 TC103 (Figure 7)		

Table 1 – 2

FM MPX Alignment

STEP	FM SG FREQUENCY/ CALIBLATION	MODULATING FREQUENCY/ DEVIATION	SWITCHES OF THE TUNER	DIAL POINTER POSITION	ADJUST-MENT POINT	PROCEDURE	REMARKS
1	98 MHz/60 dBμ	(Unmodulated carrier)	A. POWER to "ON". B. SELECTOR to "FM". C. MODE to "STEREO".	98 MHz (Set to that DC voltmeter indicates zero volt.)	HVR301 (Figure 7)	Adjust for 76 ± 0.2 kHz.	Both the separations (both the outputs of right and left channel) should be equal.
2		1000 Hz/stereo [main (L) & sub (-L) : ±67.5 kHz/ pilot signal: ±7.5 kHz]			HVR302 (Figure 7)	Adjust for maximum separation (or minimum output of right channel).	
3		1000 Hz/stereo [main (R) & sub (−R): ±67.5 kHz/ pilot signal: ±7.5 kHz]				Adjust for maximum separation (or minimum output of left channel).	

Table 1 – 3

AM SECTION

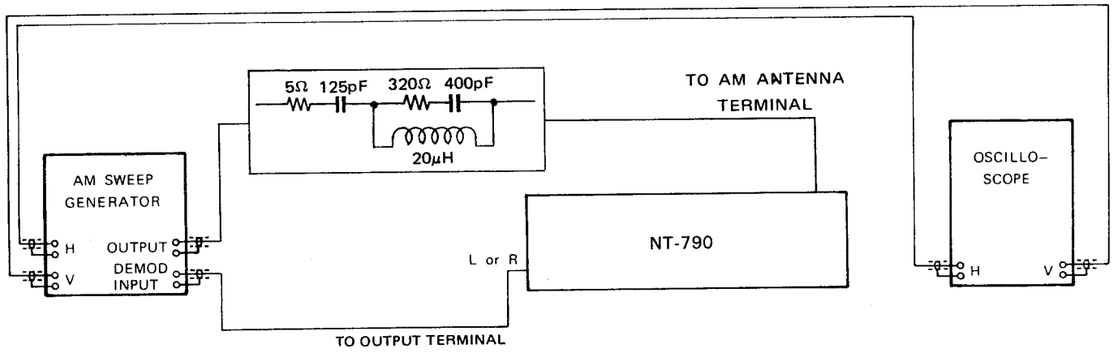


Figure 8. Test Equipment Hook-up

AM IF Alignment

STEP	AM SG FREQUENCY/ CALIBLATION		MODULATING FREQUENCY/ DEVIATION	SWITCHES OF THE TUNER	DIAL POINTER POSITION	ADJUST FOR MAX. SCOPE INDICATION	REMARKS
1	50 dBμ	Set AM SG IF/ RF switch to "IF" position.	(Unmodulated carrier)	A. POWER to "ON" B. SELECTOR to "AM"	High frequency end of the dial scale.	T203 (Figure 7, 9)	Repeat steps 1 and 2 until response curve on oscilloscope indicates maximum waveform.
2						T204 (Figure 7, 9)	

Table 2 – 1

AM Frequency Covorage and AM Tracking Alignment

These adjustments are factory preset and normally need no further adjustment. However, if necessary proceed as follows:

STEP	AM SG FREQUENCY/ CALIBLATION		MODULATING FREQUENCY/ DEVIATION	SWITCHES OF THE TUNER	DIAL POINTER POSITION	ADJUST FOR MAX. SCOPE INDICATION	REMARKS
1	520 kHz/ 50 dBμ	Set AM SG IF/ RF switch to RF position.	400 Hz/30%	A. POWER to "ON" B. SELECTOR to "AM"	Low frequency end of the dial scale.	T202 (Figure 7,10) Figure 4)	Repeat steps 1 and 2 several times.
2	1650kHz/ 50 dBμ				High frequency end of the dial scale.	TC202 (Figure 7,10) Figure 4)	
3	600 kHz/ 50 dBμ				600 kHz	T201 (Figure 7)	Repeat steps 3 and 4 several times.
4	1400kHz/ 50 dBμ				1400 kHz	TC201 (Figure 7)	

Table 2 – 2

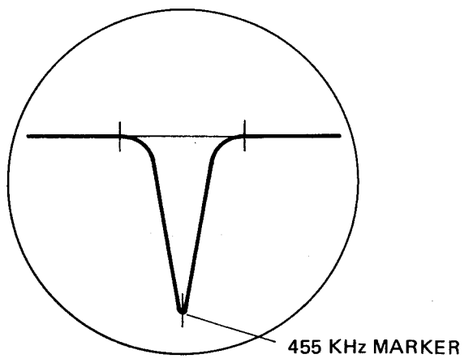


Figure 9. AM IF

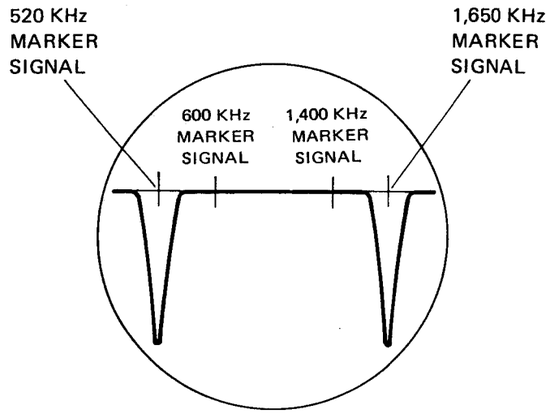


Figure 10. AM Frequency Coverage

PC BOARD (BOTTOM VIEW)

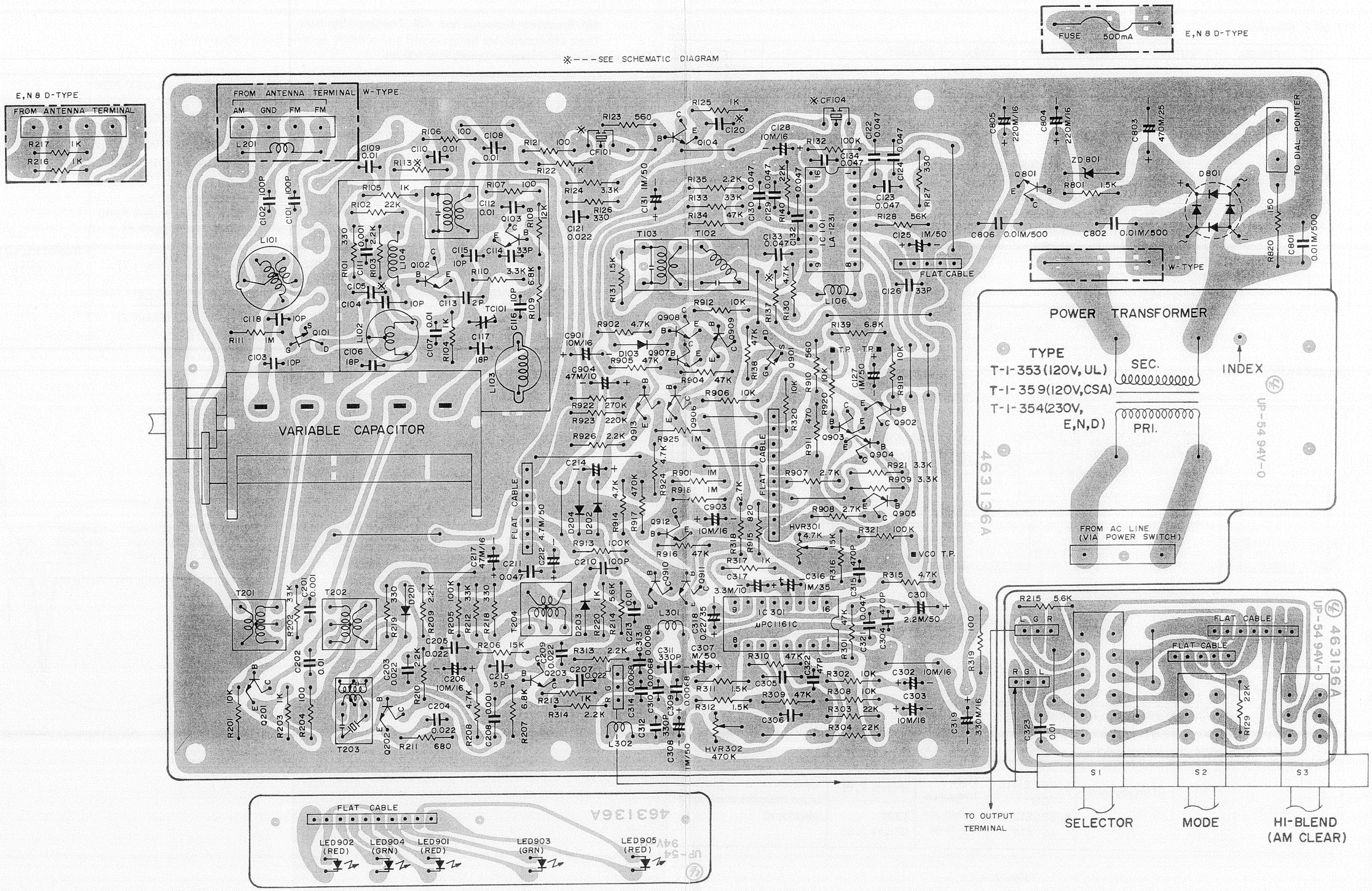
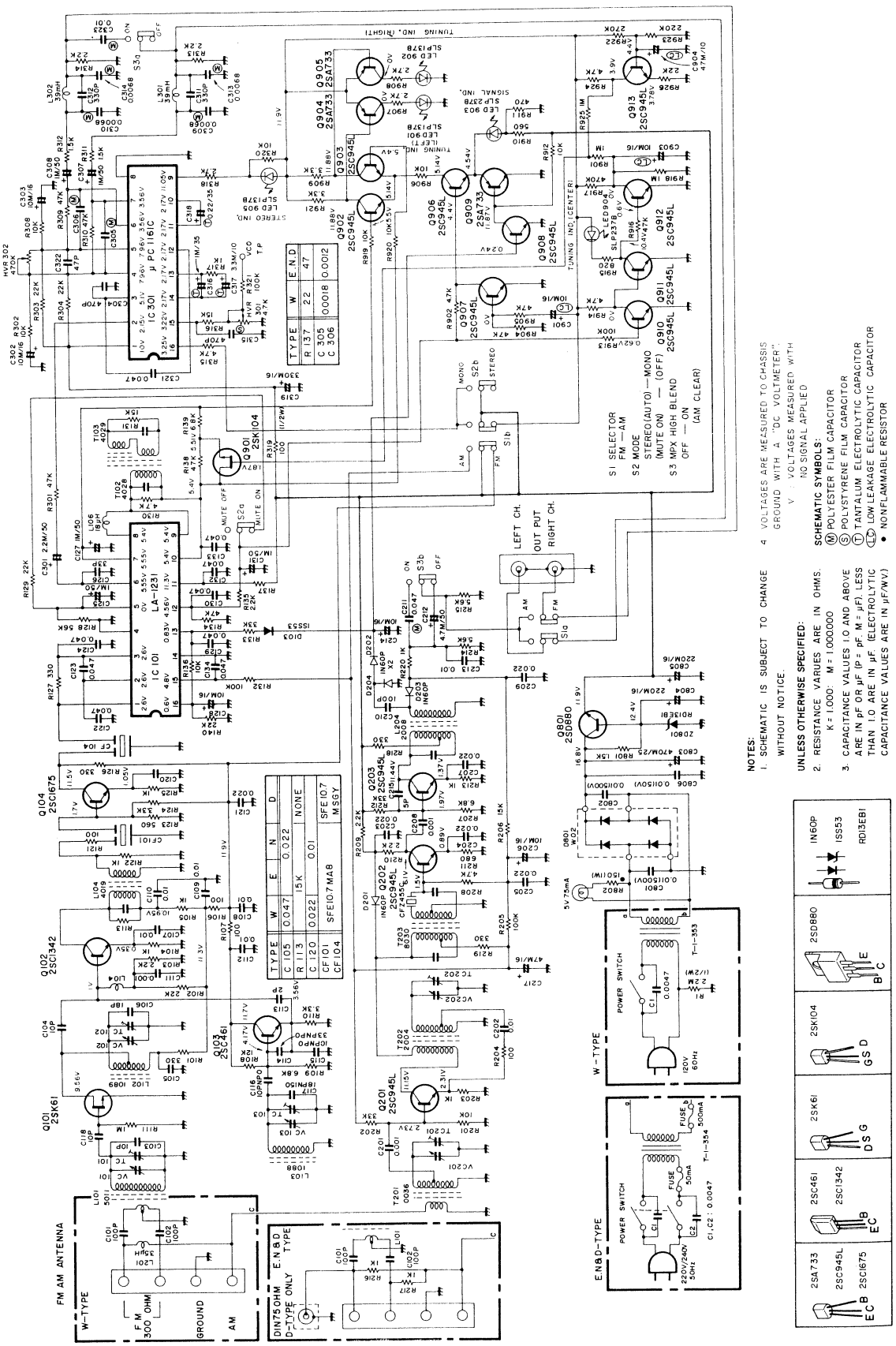


Figure 11

SCHEMATIC DIAGRAM

Figure 12



DIAL CORD INSTALLATION

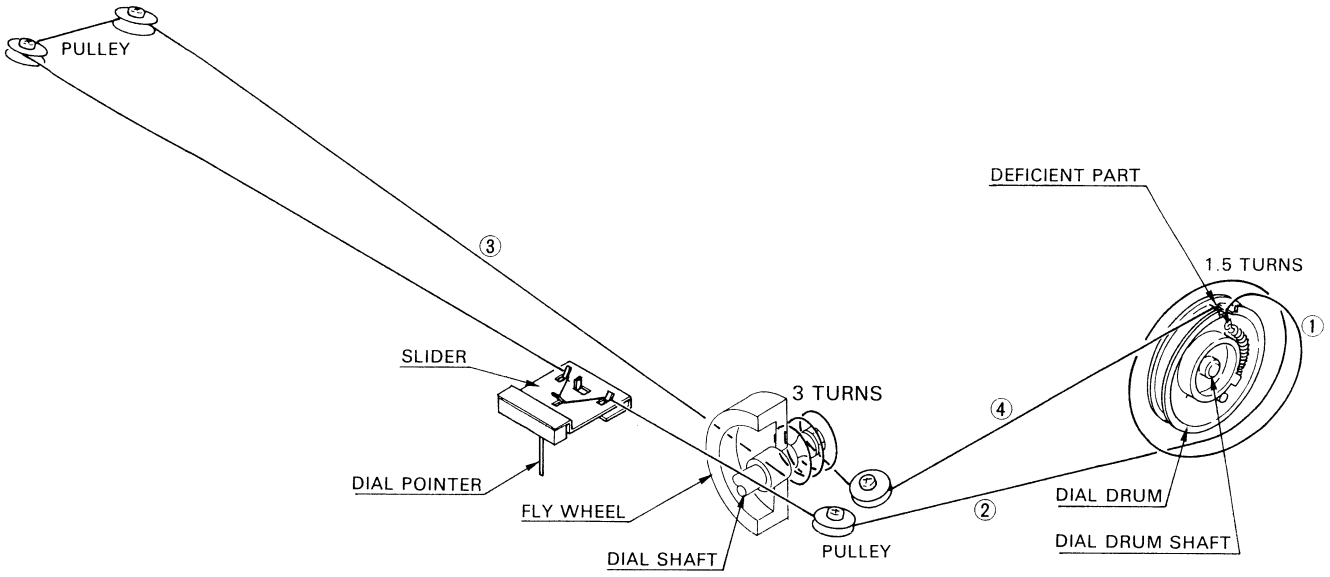


Figure 13

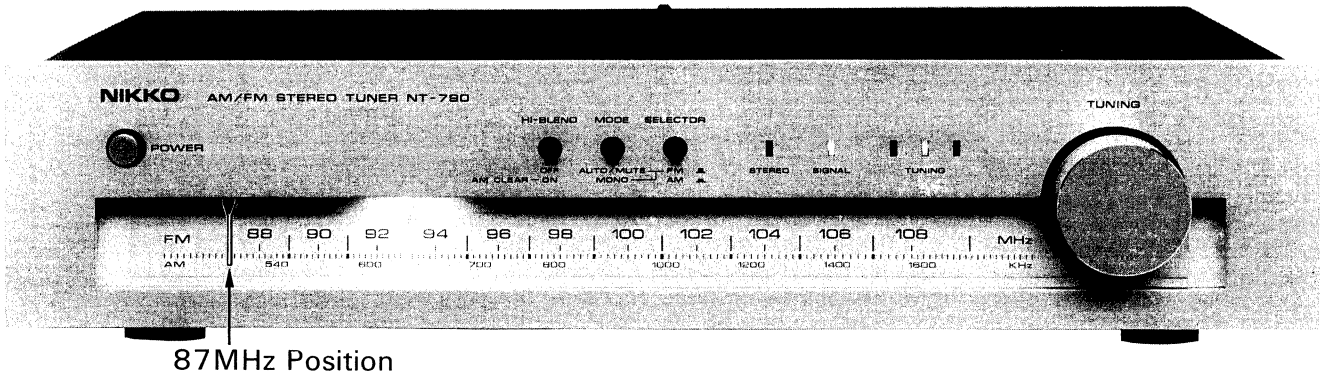


Photo 3

1. Remove an old dial cord.

2. Turn the dial drum shaft counter-clockwise until the rotor of the variable capacitor is completely out of the stator. If the deficient part of the dial drum is not in a straight line with the dial drum shaft (vertically), loosen the dial drum drive screws and adjust the dial drum to be placed on the top portion. Then re-tighten the dial drum screws.

3. String the dial drum and pulleys with a new dial cord in accordance with Fig. 13 (in circled numbered order).

4. Turn the dial shaft (Tuning knob) counter-clockwise until the rotor of the variable capacitor is fully rotated in the stator. Then fix the dial pointer to the string at a reading of 87 MHz on the dial scale. (See Photo 3)

PARTS LOCATION

NOTE: Numbers of three digits with a ◯ are related to the KEY NUMBERS on parts list.

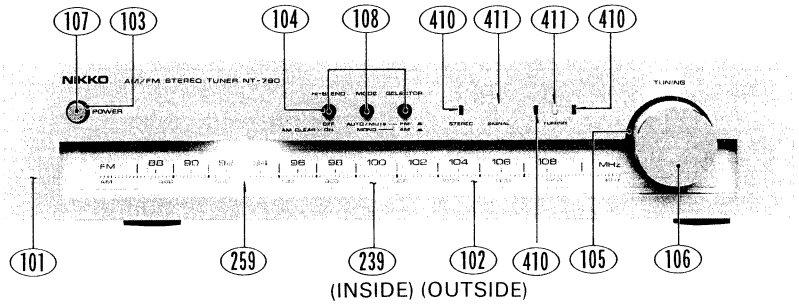


Photo 4

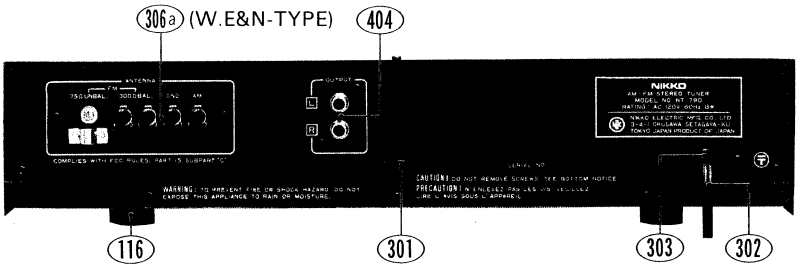


Photo 5

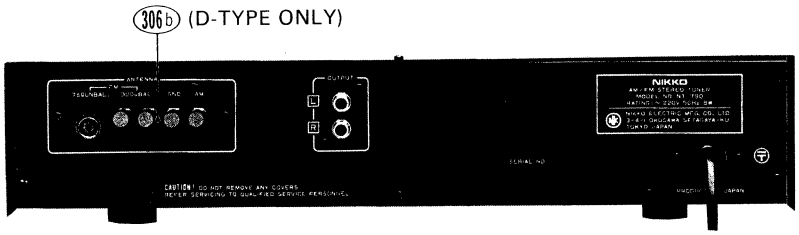


Photo 6

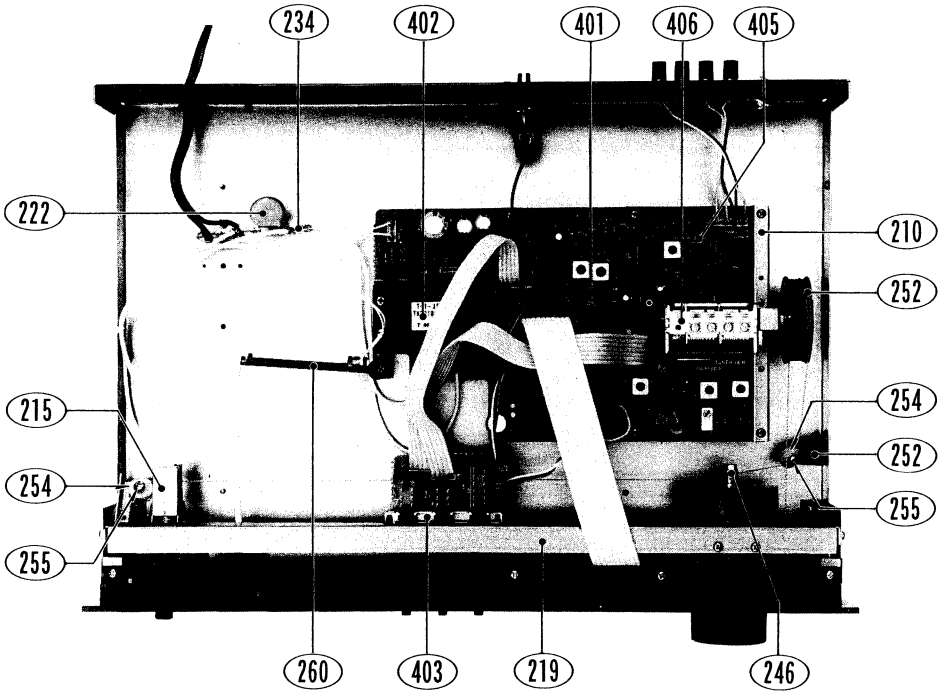


Photo 7

PARTS LIST

NOTES:

1. ★ The KEY NUMBER (#) marked with a (★) on parts list relate to number of three digits with a (◯). (Photo 4 – 7)
2. + Numberals in file indicate the quantity of parts used in one type.
3. ++ TR : Transistor
   FET : Field effect transistor
   VR : Volume control (Variable resistor)
   RES : Carbon film fixed resistor
   MO-RES : Metal oxide film fixed resistor
   CEM-RES : Cemented wirewound fixed resistor
   FP : Flame proof
   C-CAP : Ceramic capacitor
   E-CAP : Aluminium electrolytic capacitor
   M-CAP : Polyester film capacitor
   S-CAP : Polystyrene film capacitor
   T-CAP : Tantalum electrolytic capacitor
   BP-CAP : Bipolar electrolytic capacitor
   LC-CAP : Low current leakage electrolytic capacitor.
4. Assemblies and parts are subject to change without notice.
5. Parts ordering procedure:
   A. DO NOT USE THE "KEY" NUMBER AND "SYMBOL" NUMBER. (these are control # for the factory only)
   B. Include in any order
      a. Part number.
      b. Part description.
      c. Model number.

      (any of the above lacking from an order may delay shipment of that order.)

KEY NO.	SYMBOL NO.	TYPE+ W E N D	DESCRIPTION++	PART NO.
			PACKING MATERIALS & ACCESSORIES	
001		1 1 1 1	Carton box	9825550
002		2 2 2 2	Pad	9840830
003		1 1 1 1	Sack, polyethylen cloth	9840550
004		1 1 1 –	Sack, polyethylen cloth – #13	9640320
005		– – – 1	Envelope – G	9690170
006a		1 – – –	Manual, instruction – E	960278E
006b		– 1 1 –	Manual, instruction – K	960279K
006c		– – – 1	Manual, instruction – G	960280G
007		1 – – –	List, service stations	9690180
008		1 – – –	Card, warranty	967007A
009		1 – – –	Post card	967008A
010		1 1 1 1	Cloth, polishing	9690040
011		1 1 1 1	Drier – Silica gel	9690010
012		1 1 1 1	Antenna, FM – Q-MATCH	4581360
013		1 1 1 1	Cord, RCA phono pin plug – 2T	962016A
			CABINET ASSEMBLY	
★101a		1 1 1 1	Panel, front – SILVER	7884410
★101b		1 1 1 1	Panel, front – BLACK	7884490
★102		1 1 1 1	Window, panel	7802410
★103		1 1 1 1	Guide, button – 125BP – power	7402110
★104		3 3 3 3	Guide, button – 1P5 – hi-blend/mode/selector	7401710
★105		1 1 1 1	Blind, for tuning knob	7002060
★106a		1 1 1 1	Knob – 19SL-42 (T) – tuning, SILVER	7841220
★107a		1 1 1 1	Button, push – M10SL-12 – power, SILVER	7852060
★106b		1 1 1 1	Knob – 19BK-42 (T) – tuning, BLACK	7841280
★107b		1 1 1 1	Button, push – M10BK-12 – power, BLACK	7852070
★108		3 3 3 3	Button, push – P5x15 BKII – hi-blend/mode/selector	7852090
109		3 3 3 3	Relay shaft – 26.5, for push button	7401730
110		1 1 1 1	Cover, metal	7820930
111		6 6 6 6	Screw – TFTS 4φx10	887410W
112		6 6 6 6	Washer – 4φ	893104W
113		3 3 3 3	Screw – PTS 3φx6	814306W
114		1 1 1 1	Plate, bottom	7325440
115		4 4 4 4	Screw – PTS 3φx6	814306S
★116		4 4 4 4	Foot, polyethylen	7401810
117		4 4 4 4	Screw – PTS 3φx12	814312S
			CHASSIS ASSEMBLY	
201		1 1 1 1	(BACK PLATE ASSEMBLY)	
202		5 5 5 5	Screw – PTS 3φx6	814306W
203		2 2 2 2	Screw – PTS 3φx8	814308W
204			(TUNER-REG PCB ASSEMBLY)	
205		2 2 2 2	Holder, PCB – (A)	7226820
206		2 2 2 2	Holder, PCB – (B)	7032380
207		14 14 14 14	Screw – PTS 3φx6	814306S
208		4 4 4 4	Screw – PTS 4φx10	814410S
209		2 2 2 2	Screw – PMS 3φx6	810306S
★210		1 1 1 1	Stay, PCB – (R)	7033000
211		2 2 2 2	Screw – PTS 3φx8	814308S
212		1 1 1 1	Plate, left side	7226830
213		1 1 1 1	Plate, right side	7226840
214		6 6 6 6	Screw – PTS 3φx16	814306S
★215a		1 – – –	Switch, push – SDV1P 901 – power, spst	4041140
★215b		– 1 1 1	Switch, push – SDG-5PE 20 – power, dpst	4041150
216		2 – – –	Screw – PMS 3φx6	810306S
217		– 2 2 2	Screw – PMS 3φx8	810308S
218		– 1 1 1	Spacer, power switch	7002150
★219		1 1 1 1	Angle, front	7226850
220		4 4 4 4	Screw – PTS 3φx6	814306S
221		– 2 2 2	Screw – PTS 3φx8	814308S
★222a	C1	1 – – –	C-CAP 0.0047uf AC125V	239472C
★222b	C2,C3	– 2 2 2	C-CAP 0.0047uf AC250V	239472E
223		– 2 2 2	Cover, C-CAP – 23φ	7400980
224		1 – – –	RES 2.2 meg.ohm 10% ½W	325225K
225			(LED PCB ASSEMBLY)	
226		1 1 1 1	Holder, LED PCB	7032390
227		2 2 2 2	Screw – PTS 3φx6	814306S
228		3 3 3 3	Rivet, push – 3φx4.5	7401240
229		– 1 1 1	Midget fuse – (S) 50 mAT	4720460
230		– 1 1 1	Holder, midget fuse – 1P	4581430
231		– 1 1 1	Screw – PMS 3φx8	810308S
232		– 1 1 1	Washer – TW (I) 3φ	893403U
233		– 1 1 1	Washer – IN 3φ	892013S
★234		1 – – –	Lug – 2L5P (W)	442251W
235		2 – – –	Screw – PMS 3φx8	810308S
236		2 – – –	Washer – TW (I) 3φ	893403U
237		2 – – –	Washer – IN 3φ	892013S
238		2 1 1 1	Tye, nylon	7401880
★239		1 1 1 1	Dial scale	7884420
240		4 4 4 4	Screw – PTS 3φx6	814306S
241		1 1 1 1	Blind, dial – left	7401640
242		1 1 1 1	Blind, dial – right	7401650
243		2 2 2 2	Screw – PTS 3φx8	814308S
244		1 1 1 1	Holder, dial shaft	7226860
245		4 4 4 4	Screw – PTS 3φx6	814306S
★246		1 1 1 1	Dial shaft, with fly wheel	7152420
247		1 1 1 1	Washer – SN 9φ	892249S
248		1 1 1 1	Washer – TW (I) 9φ	893409U
249		1 1 1 1	Washer – 9φ	893109S

PART ORDERING PROCEDURE ----- DO NOT USE THE "KEY" NUMBER AND "SYMBOL" NUMBER. (these are control # for the factory only.) Include in any order: a. Part number, b. Part description, c. Model number. (any of the above lacking from an order may delay shipment of the order.)

KEY NO.	SYMBOL NO.	TYPE+ WEND	DESCRIPTION++	PART NO.
250		1111	Bracket, pulley – (A)	7032410
251		1111	Bracket, pulley – (B)	7032420
★252		1111	Bracket, pulley – (C)	7032430
253		5555	Screw – PTS 3φx6	814306S
★254		4444	Pulley – 9φ	7400790
★255		4444	Shaft, pulley – 4L	7120980
★256		1111	Dial drum – 46.5φ	7401790
257		1111	Spring, dial drum – (K)	7440300
258		1111	Cord, dial	4581870
★259		1111	NEEDLE SUB ASSEMBLY – dial pointer	7860560
★260		1111	Connector, wire	7401800
261		1111	Shaft – 4L	7120980
			BACK PLATE ASSEMBLY	
★301a		1---	Plate, back – W	7325460
★301b		-111	Plate, back – D	7325660
★302a		1---	Plug/Cord – DP-70	606007A
★302b		-111	Plug/Cord – CEE-2T	600510A
★303a		1---	Stopper, cord – SR-3P-4	7400620
★303b		-111	Stopper, cord – SR-4N-4	7400690
304b		1---	Bracket, cord – UL	7029300
304b		-111	Bracket, cord – EH	7029800
305		2222	Screw – PTS 3φx6	814306W
★306a		111-	Terminal, antenna	4450520
★306b		---1	Terminal, antenna – 5PD	4450560
307		222-	Screw – PMS 3φx6	810306W
308		--2	Screw – PTS 3φx8	814308W
			TUNER-REGULATOR PC BOARD ASSEMBLY	
★401a		1---	TUNER-REGULATOR PCB ASSEMBLY – FM de-emphasis 75us	9492850
★401b		-11-	TUNER-REGULATOR PCB ASSEMBLY – FM de-emphasis 50us	9492860
★401c		---1	TUNER-REGULATOR PCB ASSEMBLY – D-type only	9492870
★402a		1---	Transformer, power – T-1-353 – 120V, UL	1103530
★402b		-111	Transformer, power – T-1-354 – 230V class II	1103540
★402c		1---	Transformer, power – T-1-359 – 120V, CSA	1103590
★403	S1~3	1111	Switch, tri push – SUF34 – hi-blend/ mode/selector	4041160
★404		1111	Terminal, RCA phono pin jack-2P – output	4442050
			(FM FRONT END SECTION)	
★405		1111	Shield plate	7226370
★406		1111	Capacitor, variable – C-751 GR-H	4235130
	L101	1111	Coil, FM antenna	1250110
	L102	1111	Coil, FM RF	1210890
	L103	1111	Coil, FM oscillator	1210880
	L104	1111	Coil, FM choke	1210870
	T101	1111	Transformer, FM IF – 4019	1240190
	TC101	1111	Capacitor, trimmer – TRM 10pf	4241050
	Q101	1111	FET 2SK61 (GR)	516024S
	Q102	1111	TR 2SC1342 (B or C)	515070S
	Q103	1111	TR 2SC461 (B or C)	515015S
	C101,102	2222	C-CAP 100pf 10% 50V SL	232101K
	C103,104	2222	C-CAP 10pf ±0.5pf 50V SL	232100D
	C105	1---	C-CAP 0.047uf +80, –20% 50V YG	231473Z
	C105	-111	C-CAP 0.022uf +80, –20% 50V YG	231223Z
	C106	1111	C-CAP 18pf 10% 50V SL	232180K
	C107			
	~C110	4444	C-CAP 0.01uf +80, –20% 50V YG	231103Z
	C111	1111	C-CAP 0.001uf +80, –20% 50V YG	231102Z
	C112	1111	C-CAP 0.01uf +80, –20% 50V YG	231103Z
	C113	1111	C-CAP 2pf ±0.5pf 50V SL	232209D
	C114	1111	C-CAP 33pf 10% 50V NPO	232330C
	C115,116	2222	C-CAP 10pf ±0.5pf 50V NPO	232100C
	C117	1111	C-CAP 18pf 10% 50V N-150	232180F
	C118	1111	C-CAP 10pf ±0.5pf 50V SL	232100D
	R101	1111	RES 330ohm 5% ¼W	328331J
	R102	1111	RES 22kohm 5% ¼W	328223J
	R103	1111	RES 2.2kohm 5% ¼W	328222J
	R104,105	2222	RES 1kohm 5% ¼W	328102J
	R106,107	2222	RES 100ohm 5% ¼W	328101J
	R108	1111	RES 12kohm 5% ¼W	328123J
	R109	1111	RES 6.8kohm 5% ¼W	328682J
	R110	1111	RES 3.3kohm 5% ¼W	328332J
	R111	1111	RES 1meg.ohm 5% ¼W	328105J
	R112		– DELETED –	
	R113	111-	RES 15kohm 5% ¼W	328153J
			(FM IF SECTION)	
	L105	1111	Inductor – 18uh 5%	1210850
	T102	1111	Transformer, FM descriminator – (1) SNY1719	1240280
	T103	1111	Transformer, FM descriminator – (2) SNY1720	1240290
	CF101,104	222-	Celamic filter – SFE10.7MA8	128023A
	CF101,104	---2	Celamic filter – SFE10.7MSGY	128051A
	IC101	1111	IC LA-1231	518073S
	Q104	1111	TR 2SC1675 (L or M)	515082S
	D103	1111	Diode 1SS53	501023S
	C120	1---	C-CAP 0.022uf +80, –20% 50V YG	231223Z
	C120	-111	C-CAP 0.01uf +80, –20% 50V YG	231103Z
	C121	1111	C-CAP 0.022uf +80, –20% 50V YG	231223Z
	C122			
	~C124	3333	C-CAP 0.047uf +80, –20% 50V YG	231473Z
	C125	1111	E-CAP 1uf 50V	211510Q
	C126	1111	C-CAP 33pf 10% 50V SL	232330K
	C127	1111	E-CAP 1uf 50V	211510Q
	C128	1111	E-CAP 10uf 16V	211220Q
	C129,130	2222	C-CAP 0.047uf +80, –20% 50V YG	231473Z
	C131	1111	E-CAP 1uf 50V	211510Q
	C132			
	~C134	3333	C-CAP 0.047uf +80, –20% 50V YG	231473Z
	C135	1111	C-CAP 0.022uf +80, –20% 50V YG	231223Z
	R121	1111	RES 100ohm 5% ¼W	328101J
	R122	1111	RES 1kohm 5% ¼W	328102J
	R123	1111	RES 560ohm 5% ¼W	328561J
	R124	1111	RES 3.3kohm 5% ¼W	328332J
	R125	1111	RES 1kohm 5% ¼W	328102J
	R126,127	2222	RES 330ohm 5% ¼W	328331J
	R128	1111	RES 56kohm 5% ¼W	328563J
	R129	1111	RES 22kohm 5% ¼W	328223J
	R131	1111	RES 1.5kohm 5% ¼W	328152J
	R132,133	1111	RES 100kohm 5% ¼W	328104J
	R134	1111	RES 47kohm 5% ¼W	328473J
	R135	1111	RES 2.2kohm 5% ¼W	328222J
	R136	1111	RES 10kohm 5% ¼W	328103J
	R137	1---	RES 22ohm 5% ¼W	328220J
	R137	-111	RES 47ohm 5% ¼W	328470J
	R138	1111	RES 47kohm 5% ¼W	328473J
	R139	1111	RES 6.8kohm 5% ¼W	328682J
	R140	2222	RES 22kohm 5% ¼W	328223J

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KEY NO.	SYMBOL NO.	TYPE+ WEND	DESCRIPTION++	PART NO.
			(AM SECTION)	
	L201	1 ----	Coil, peaking – 3.5 mh	1210240
	T201	1111	Coil, AM antenna	1200360
	T202	1111	Coil, AM oscillator	1220040
	T203	1111	Coil, with AM celamic filter – CFZ-455C	1280300
	Q201 ~ Q203	3333	TR 2SC945L (P or Q)	515077S
	D201 ~ D203	4444	Diode 1N60P	500001G
	C201	1111	C-CAP 0.001uf +80, –20% 50V YG	232102Z
	C202	1111	C-CAP 0.01uf +80, –20% 50V YG	231103Z
	C203 ~C205	3333	C-CAP 0.0022uf +80, –20% 50V YG	231223Z
	C206	1111	E-CAP 10uf 16V	211220Q
	C207	1111	C-CAP 0.022uf +80, –20% 50V YG	231223Z
	C208	1111	C-CAP 0.001uf +80, –20% 50V YG	232102Z
	C209	1111	C-CAP 0.022uf +80, –20% 50V YG	231223Z
	C210	1111	C-CAP 100pf 10% 50V SL	232101K
	C211	1111	M-CAP 0.047uf 5% 50V	222473J
	C212	1111	E-CAP 0.47uf 50V	211505Q
	C213	1111	C-CAP 0.01uf +80, –20% 50V YG	231103Z
	C214	1111	E-CAP 10uf 16V	211220Q
	C215	1111	C-CAP 5pf ±0.5pf 50V SL	232509D
	C216		– DELETED –	
	C217	1111	E-CAP 47uf 16V	211225Q
	R201	1111	RES 10kohm 5% ¼W	328103J
	R202	1111	RES. 33kohm 5% ¼W	328333J
	R203	1111	RES 1kohm 5% ¼W	328102J
	R204	1111	RES 100ohm 5% ¼W	328101J
	R205	1111	RES 100kohm 5% ¼W	328104J
	R206	1111	RES 15kohm 5% ¼W	328153J
	R207	1111	RES 6.8kohm 5% ¼W	328682J
	R208	1111	RES 4.7kohm 5% ¼W	328472J
	R209,210	2222	RES 2.2kohm 5% ¼W	328222J
	R211	1111	RES 680ohm 5% ¼W	328681J
	R212	1111	RES 33kohm 5% ¼W	328333J
	R213	1111	RES 1kohm 5% ¼W	328102J
	R214,215	2222	RES 5.6kohm 5% ¼W	328562J
	R216,217	–222	RES 1kohm 5% ¼W	328102J
			(MPX SECTION)	
	L301,302	2222	Inductor – 39 mh 10%	1260120
	IC301	1111	IC uPC1161C	518055S
	C301	1111	E-CAP 2.2uf 50V	211512Q
	C302,303	2222	E-CAP 10uf 16V	211220Q
	C304	1111	C-CAP 470pf 10% 50V SL	232471K
	C305,306	2---	M-CAP 0.0018uf 5% 50V	222182J
	C305,306	–222	M-CAP 0.0012uf 5% 50V	222122J
	C307,308	2222	E-CAP 1uf 50V	211510Q
	C309,310	2222	M-CAP 0.0068uf 5% 50V	222682J
	C311,312	2222	C-CAP 330pf 10% 50V SL	232331K
	C313,314	2222	M-CAP 0.0068uf 5% 50V	222682J
	C315	1111	S-CAP 470pf 5% 50V	223471V
	C316	1111	T-CAP 1uf 35V	252410M
	C317	1111	T-CAP 3.3uf 10V	252113M
	C318	1111	T-CAP 0.22uf 35V	252402M
	C319	1111	E-CAP 330uf 16V	211233Q
	C320		– DELETED –	
	C321	1111	C-CAP 0.047uf +80, –20% 50V YG	231473Z
	C322	1111	C-CAP 47pf 10% 50V SL	232470K
	HVR301	1111	Potentiometer – SR19R B4.7kohm	4300630
	HVR302	1111	Potentiometer – SR19R B470kohm	4300740

KEY NO.	SYMBOL NO.	TYPE+ WEND	DESCRIPTION++	PART NO.
	R301	1111	RES 47kohm 5% ¼W	328473J
	R302	1111	RES 10kohm 5% ¼W	328103J
	R303,304	2222	RES 22kohm 5% ¼W	328223J
	R305 ~ R307		– DELETED –	
	R308	1111	RES 10kohm 5% ¼W	328103J
	R309,310	2222	RES 47kohm 5% ¼W	328473J
	R311,312	2222	RES 1.5kohm 5% ¼W	328152J
	R313,314	2222	RES 2.2kohm 5% ¼W	328222J
	R315	1111	RES 4.7kohm 5% ¼W	328472J
	R316	1111	RES 15kohm 5% ¼W	328153J
	R317	1111	RES 1kohm 5% ¼W	328102J
	R318	1111	RES 2.7kohm 5% ¼W	328272J
	R319	1111	RES 100ohm 5% ¼W	329101J
	R320	1111	RES 10kohm 5% ¼W	328103J
			(REGULATOR SECTION)	
	Q801	1111	TR 2SD880 (Y or GR)	513106S
	D801	1111	Diode W02	560061S
	ZD801	1111	Zener diode RD13EB1	502049S
407		–111	Midget fuse – (S) 500mAT 250V	4720390
408		–222	Holder, midget fuse	7050430
	C801,802	2222	C-CAP 0.01uf +100, –0% 500V	238103P
	C803	1111	E-CAP 470uf 25V	211335Q
	C804,805	2222	E-CAP 220uf 16V	211232Q
	C806	1111	C-CAP 0.01uf +80, –20% 50V YG	231103Z
	R801	1111	RES 1.5kohm 5% ¼W	328152J
	R802	1111	FP-MO-RES 150ohm 5% 1W	361151L
			(LED INDICATOR SECTION)	
409		1111	Spacer, LED	7903130
	Q901	1111	FET 2SK104 (F)	516026S
	Q904,905, Q909	3333	TR 2SA733A (P or Q)	514074S
	Others	9999	TR 2SC945L (P or Q)	515077S
★410	LED901, 902,905	3333	LED SLP137B – red	5060130
★411	LED903, 904	2222	LED SLP237B – green	5060140
	C901,903	2222	LC-CAP 10uf 16V	211220L
	C902		– DELETED –	
	C904	1111	LC-CAP 47uf 10V	211125L
	R901	1111	RES 1meg.ohm 5% ¼W	328105J
	R902	1111	RES 4.7kohm 5% ¼W	328472J
	R903		– DELETED –	
	R904,905	2222	RES 47kohm 5% ¼W	328473J
	R906	1111	RES 10kohm 5% ¼W	328103J
	R907,908	2222	RES 2.7kohm 5% ¼W	328272J
	R909	1111	RES 3.3kohm 5% ¼W	328332J
	R910,911	2222	RES 470ohm 5% ¼W	328471J
	R912	1111	RES 10kohm 5% ¼W	328103J
	R913	1111	RES 100kohm 5% ¼W	328104J
	R914	1111	RES 4.7kohm 5% ¼W	328472J
	R915	1111	RES 820ohm 5% ¼W	328821J
	R916	1111	RES 47kohm 5% ¼W	328473J
	R917	1111	RES 470kohm 5% ¼W	328474J
	R918	1111	RES 1meg.ohm 5% ¼W	328105J
	R919,920	2222	RES 10kohm 5% ¼W	328103J
	R921	1111	RES 3.3kohm 5% ¼W	328332J
	R922,923	2222	RES 220kohm 5% ¼W	328224J
	R924	1111	RES 4.7kohm 5% ¼W	328472J
	R925	1111	RES 1meg.ohm 5% ¼W	328105J
	R926	1111	RES 2.2kohm 5% ¼W	328222J

SEMICONDUCTOR DATA

TRANSISTORS

† NOTES Ge: Germanium Si: Sillicon
A: Alloy B: Base D: Diffused Dd: Double-diffused
Df: Drift-field E: Epitaxial G: Grown J: Junction
M: Mesa P: Planer Pc: Point-contact Td: Triple-diffused

DEVICE TYPE	APPLICATIONS	STRUCTURE†	MAXIMUM RATINGS Absolute-Maximum Values: (T_A = 25°C unless otherwise specified)					ELECTRICAL CHARACTERISTICS Typical Values: (T_A = 25°C unless otherwise specified)														MANUFACTURER
			Collector-to-Base Voltage V_{CBO} (V)	Emitter-to-Base Voltage V_{EBO} (V)	Collector Current I_C (mA)	Collector Dissipation P_C (mW)	Junction Temperature T_J (°C)	Collector Cutoff Current I_{CBO} (uA)	V_{CB} (V)	Static Forward-Current Transfer Ratio h_{FE}	V_{CE} (V)	I_C (mA)	Collector-Emitter Saturation Voltage $V_{CE(sat)}$ (V)	I_C (mA)	I_B (mA)	Gain-Bandwidth Product f_T typ. f_{ab}* (MHz)	V_{CE} V_{CB}* (V)	I_E I_C* (mA)	Output Capacitance C_{ob} (pF)	Base Spreading Resistance $r_{bb'}$ h_{ie}* (real) (Ω)	V_{CE} V_{CB}* (V)	I_E (mA)	
2SA733A (P, Q)	AF,	PNP Si-E	−60	−5	−100	250	125	−0.1 max.	−60	135 ~400	−6	−1	−0.3 max.	−100	−10	180	−6	10	6 max.				NEC
2SC461 (B, C)	RF, Conv.	NPN Si-LTP	30	5	100	200	125	0.5 max.	18	60 ~200	12	2	1.1 max.	10	1	230	12	−2*	3.5 max.				HITACHI
2SC945L (P, Q)	AF,	NPN Si-E	60	5	100	250	125	0.1 max.	60	135 ~400	6	1	0.3 max.	100	10	300	6	−10	5 max.				NEC
2SC1342 (B, C)	RF, Mixer	NPN Si-P	30	4	30	100	125	0.5 max.	10	60 ~200	6	1	1.2 max.	10	1	250	6	−1*	1.5 max.				HITACHI
2SC1675 (L, M)	RF, Mixer, Osc. (in FM/AM radio)	NPN Si-E	50	5	30	250	125	0.1 max.	50	40 ~120	6	1	0.3 max.	10	1	250	6	−1	2.2 max.	C_{rb} $r_{bb'}$ = 10pS	6*	−10	NEC
2SD880 (Y, GR)	AF, Power amp.	NPN Si-Td	60	7	3A	30W (Tc=25°C)	150	100 max.	60	100 ~300	5	0.5A	1.0 max.	3A	0.3A	3.0	5	−0.5A	70				TOSHIBA

FIELD EFFECT TRANSISTORS

DEVICE TYPE	APPLICATIONS	STRUCTURE†	MAXIMUM RATINGS Absolute-Maximum Values (T_A = 25°C unless otherwise specified)						ELECTRICAL CHARACTERISTICS Typical Values: (T_A = 25°C unless otherwise specified)																MANUFACTURER
			Gate-to-Drain Voltage V_{GDO} (V)	Gate-to-Source Voltage V_{GSO} (V)	Gate Current I_G (mA)	Drain Current I_D (mA)	Total Dissipation P_D (mW)	Channel Temperature T_{ch} (°C)	Gate Leak Current Test Conditions	I_{GSS} (nA)	Gate to Drain Breakdown Voltage Test Conditions	$V_{(BR)GDO}$ (V)	Drain Current Test Conditions	I_{DSS} (mA)	Gate to Source Cutoff Voltage Test Conditions	$V_{GS(off)}$ (V)	Forward Transfer Admittance Test Conditions	$\|Y_{fs}\|$ (mS)	Feed Back Capacitance Test Conditions	C_{rss} (pF)	Power Gain (Common Source) Test Conditions	G_{PS} (dB)	Noise Figure Test Conditions	NF (dB)	
2SK61 (GR)	RF, FM tuner	Si N-channel junction	−18		10		200	125	V_{GS}= −0.5V	10	I_G= −100μA	18	V_{DS}= 10V	5~ 10			V_{GS}=0 V V_{DS}=10V	9	V_{GD}=-10V f=1 kHz	0.15 max.	V_{DD}=10V f_C=100MHz	18	V_{DD}=10V f_C=100MHz	3.5 max	TOSHIBA
2SK104 (F)	AF, RF General	Si N-channel junction	−30	−30	10	20	250	125	V_{GS}= −30V	10			V_{DS}= 5V	1~ 3	V_{DS}=5V I_D=10mA	−1.1	V_{DS}=5V V_{GS}=0V f=1 kHz	4.1	V_{DS}=10V V_{GS}=0V f=1 kHz	0.9					NEC

DIODES, LED'S

DEVICE TYPE	APPLICATIONS	STRUCTURE†	MAXIMUM RATINGS Absolute-Maximum Values: (T_A = 25°C unless otherwise specified)									ELECTRICAL CHARACTERISTICS Typical Values: (T_A = 25°C unless otherwise specified)							MANUFACTURER
			Reverse Surge Voltage V_{Rsurge} (V)	Peak Reverse Voltage V_{RM} (V)	Reverse Voltage V_R (V)	Peak Forward Voltage V_{FM} (V)	Peak Forward Current I_{FM} (mA)	Average Rectified Current I_O (mA)	Forward Surge Current $I_{F\,surge}$ (A)	Junction Temperature T_J (°C)	Total Power Dissipation P_D (mW)	Forward Current I_{Fmin} (mA)	Test Condition V_F (V)	Forward Voltage V_{Fmax} (V)	Test Condition I_F (mA)	Reverse Current I_{Rmax} (uA)	Test Condition V_R (V)	Others	
W02	Rectifier	Si-DJ (Bridge)			200	200		1.5A	50	125				1.0	1.0A	10		R_{th} = 50 °C/W	GENERAL INSTRUMENT
1SS53	Detector, Medium Speed Switching	Si-EP		35	30		300	100	2	200	500			0.8 1.0	1 30	0.1	30		NEC
1N60P	Detector	Ge-Pc		35	25		150	50	0.5	70				1	4	75	10		TOSHIBA
SLP-137B	Lamp (RED)	GaP			3			I_F= 30mA			70			2.4	5	10	3	I_V=1mcd (I_F=5 mA)	SANYO
SLP-237B	Lamp (GREEN)	GaP			3			I_F= 30mA			70			2.8	20	10	3	I_V=1.5mcd (I_F=20mA)	SANYO

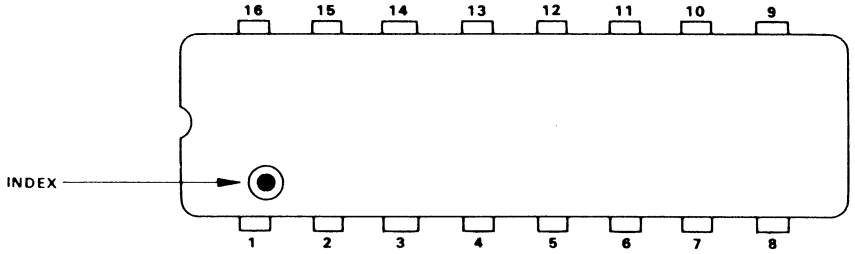
ZENER DIODES

DEVICE TYPE	APPLICATIONS	STRUCTURE†	MAXIMUM RATINGS Absolute-Maximum Values: (T_A = 25°C unless otherwise specified)			ELECTRICAL CHARACTERISTICS Typical Values: (T_A = 25°C unless otherwise specified)														MANUFACTURER
			Total Power Dissipation P_D (mW)	Zener Current I_Z (A)	Junction Temperature T_J (°C)	Zener Voltage V_Z MIN (V)	V_Z TYP (V)	V_Z MAX (V)	Test Conditions I_Z (mA)	Differential Resistance r_Z TYP (Ω)	r_Z MAX (Ω)	Test Conditions I_Z (mA)	Temperature Coefficient γ_Z TYP (%/°C)	γ_Z MAX (%/°C)	Test Conditions I_Z (mA)	Reverse Current I_Z MAX (μA)	Test Conditions V_R (V)	Others	
RD13E81	Regulator	Si-J	400		175	12.11		12.75	10		25	10				2	10		NEC

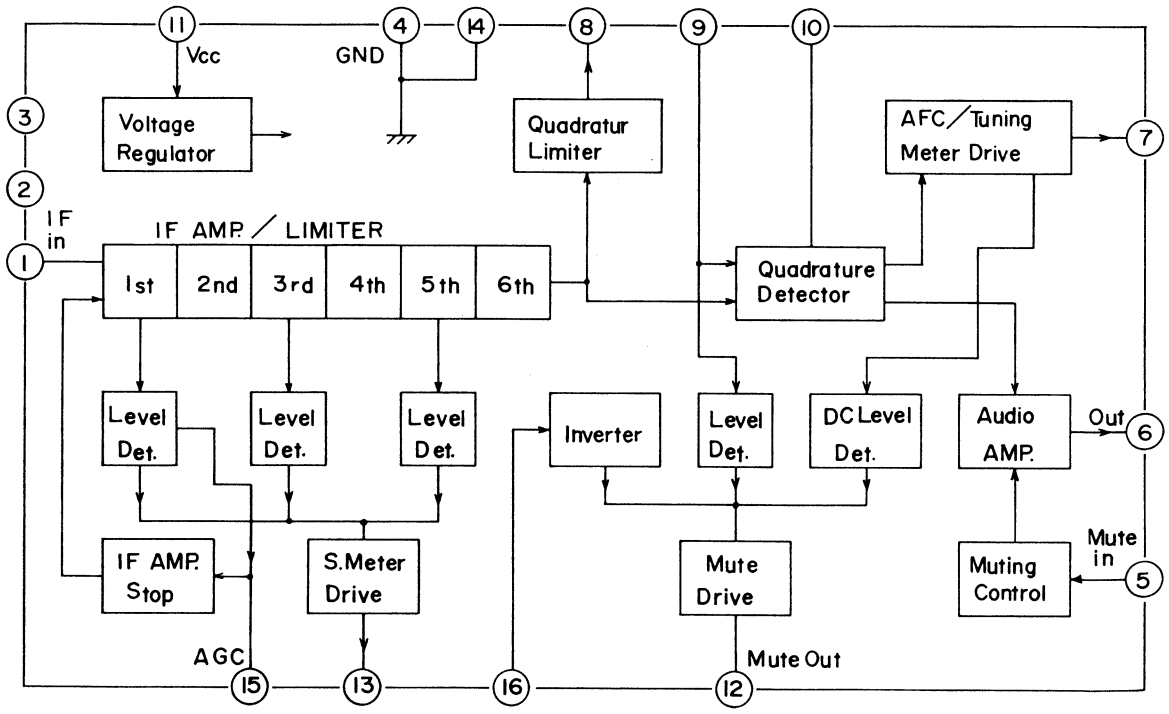
INTEGRATED CIRCUITS LA1231

DEVICE TYPE	APPLICATION	ABSOLUTE MAXIMUM RATINGS (T_A=25°C)				ELECTRICAL CHARACTERISTICS (T_A=25°C) Typical Values							MANU-FACTURER
		Supply Voltage Vcc (V)	Power Dissipation P_T (mW)	Operating Temperature Range Topr (°C)	Storage Temperature Range Tstg (°C)	Supply Current (mA)	Input Limiting Sensitivity Vin (lim) (dB_{μ})	AF Voltage (mVrms)	Total Harmonic Distortion (%)	Signal to Noise Ratio (dB)	AM Rejection (dB)	Muting Sensitivity (dB_{μ})	
LA1231	FM IF Amplifier, Quadrature Detector	16	650	−20~+70	−40~+125	20	25 (−3dB point)	330	0.05	78.5	60	29	SANYO

TERMINAL GUIDE (TOP VIEW)



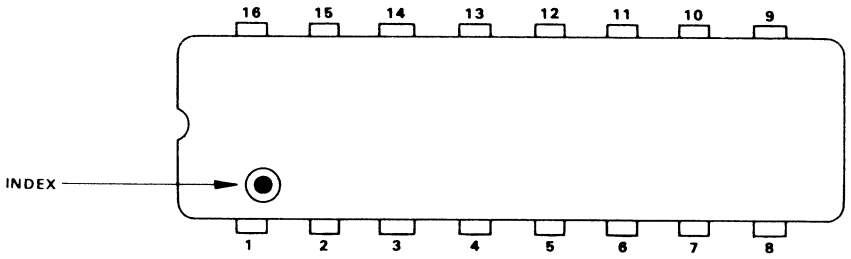
BLOCK DIAGRAM



INTEGRATED CIRCUITS μPC1161C

DEVICE TYPE	APPLICATION	MAXIMUM RATINGS Absolute-Maximum Values: (T_A = 25°C)				ELECTRICAL CHARACTERISTICS Typical Values: (T_A = 25°C)								MANUFACTURER
		Supply Voltage (V)	Power dissipation (mW)	Operating Temperature Range (°C)	Lamp Current (mA)	Supply Current (mA)	Stereo Separation (dB)	Voltage Gain (dB)	Channel Balance dB	T. H. D. (mono) (%)	T. H. D. (stereo) (%)	Signal to Noise Ratio (dB)	Stereo/mono Switching Voltages (V)	
μPC1161C	FM Stereo Demodulator	15	400	−20 ~ +70	75	20	55 (f=1 kHz)	13	−1.5min +1.5max	0.02	0.02	82	1.4	NEC

TERMINAL GUIDE (TOP VIEW)



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